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Adoption of Electronic Document Delivery in the major academic and research organisations in the Gulf States: a feasibility study in Kuwait

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Abstract

The concept of "resource sharing" between libraries was encompassed by the original aims of the Gulf States Cooperation Council, and the need for it has been stimulated by the increased amount of published information, and by users' increasing expectations that information will be rapidly supplied, regardless of their distance from its source. To outline the problems and potential, the paper outlines the nature of research and publishing in Arabic, the attempts to encourage resource sharing in the Gulf States, and the existing arrangements for Inter Library Lending. The paper also outlines the development of Electronic Document Delivery systems that facilitate Inter Library Lending.

In Kuwait, the major libraries depend on local and international Inter Library Lending to complement their collections, but have not yet fully implemented new technologies in providing this service. A case study examined the availability of relevant technology and personnel with appropriate expertise in three major libraries in Kuwait: Kuwait University, the Public Authority for Applied Education and Training, and the National Scientific and Technical Information Center. Questionnaires and interviews, intended to assess staff attitudes and perceptions, were used to examine the reasons why the Ariel system of Electronic Document Delivery appeared to have not yet been adopted, although it has been increasingly used in other parts of the world for more than 10 years. The paper notes that the adoption of this new technology in Kuwait is supported in principle, but is hindered by lack of awareness, skills and motivation, and speculates about the wider implications for the Gulf States.

Introduction

The explosion of information in the Twentieth Century and the increasing demand for it caused by the emergence of the 'Information Society' has affected academic and research library policies and procedures in several ways as they seek to fulfil the increasing demands of their users to engage with the rapid

expansion in global intellectual activity. Resource sharing by libraries has always made a contribution to meeting those needs, most commonly through the Inter Library Lending service. The new Communication and Information Technologies are not only enhancing the potential range of publications that libraries could provide for their users, but also the speed with which requests can be met.

This study provides a brief introduction to research and publishing in the Arab world, to explain the context within which supply and demand for library resources is shaped. It then outlines the aims of resource sharing and the attention that the concept has attracted in the Gulf States, particularly in terms of Inter Library Lending. Next it summarises the developments that have taken place in document delivery, culminating in the introduction of Ariel software, which facilitates Electronic Document Delivery (EDD) through the Internet. However, the focus of this study was not only to illustrate the advances in Inter Library Loan services that have been facilitated by EDD technologies, but also to examine why they have not been more widely adopted in the Gulf States. The paper therefore takes three major libraries in Kuwait as a case study, and briefly reviews the origins of their collections. Finally it considers issues such as the availability of relevant technology and personnel with appropriate expertise that were identified in surveys and interviews in Kuwait, and discusses the possible implications for the Gulf States.

Research and publishing in the Arab world

A required activity for university teachers is undertaking some form of research, not least because it provides the material they require to keep up to date in teaching their students. The publication of the results of their scholarly work and empirical research raises not only their personal professional profile and the national and international standing of their institution, but also awareness of issues and contributes to social and economic development.

In a paper written 30 years ago, Madkour (1975) identified 3 fundamental obstacles impeding the transformation and modernisation of information services in developing countries: the volume of material being published; its limited geographic dissemination; and linguistic barriers. Whilst accepting that the language barrier remained a largely unsolved problem, he argued that the use of computers and the establishment of international information systems had alleviated the first two problems areas.

Within the Arabic-speaking world, funding for research is limited, and there is little incentive to undertake it. Remuneration systems are often linked to the highest qualification already achieved, although some universities may offer financial incentives for authors, for publications varying in scale from book reviews to monographs (e.g. King Abdulaziz University, n.d.). Moreover, promotion systems may not encourage research activity and writing for publication as they do in most European and North American countries.

Most scholarly publishing has been undertaken by universities' own publishing houses, whose major activity is printing textbooks to give or loan to students. These publishers are supported directly by governmental or university subsidies. They have little financial incentive to improve sales and distribution, or publish

journals regularly (Islam, 2000). The scholarly journals published in Arabic are generally subsidised by Universities, but do not enjoy a large circulation, particularly outside the country of their origin.

The problems take on different dimensions for Arab scholars, who face a further dilemma. Although colloquial forms of technical terminology have not yet been entirely standardised, there is no significant internal linguistic barrier. However, the journals that have the highest international reputation and circulation tend to publish in English, a factor that may deter all but the most fluent from offering papers for publication in them. The consequences have been demonstrated by Al-Ansari *et al.* (2001), who examined the limited published outputs of library science faculty in the Gulf States' universities, and there is no reason to believe that the position is significantly different in other disciplines.

Those who wish to undertake research and publish in Arabic face additional challenges. Indexing systems for Arabic language journals are, at best, not well established, rendering it difficult for researchers to identify relevant material and limiting others' awareness of their output. There was no journal indexing service for Arabic language periodicals until 1981 when the Lebanese service, *Al-Fihrist*, was launched. By 1987 it was indexing 216 periodicals from 21 countries (including 5 non-Arabic speaking countries) (Nazim Ali, 1987), but it is not clear whether it has been revived since the end of the civil war in Lebanon. The records of *Index Arabicus*, which European librarians had collectively compiled to index Arabic periodical articles published from 1870 to 1969, were sent to Lebanon for printing and believed lost during the civil wars in the 1970s. However, these have recently been re-discovered and placed online by Multidata Services Inc.¹ to complement its existing databases that provide an index to 40 daily and weekly newspapers since 1994, and citations for papers in 250 specialist Arabic periodicals from 1920. In addition, Arabia Inform initiated 'AskZad' in 1998, and this now indexes over 200 newspapers and 700 journals, and provides some in full-text.² However, these services do not appear to be as widely known as their English-language counterparts.

Electronic publishing in its various forms – e-books, e-journals, e-prints, databases, or hypertext pages, whether online or on CD-ROM – has transformed the media in which information can be delivered. It is, however, fair to say that the Arabic-speaking communities are not yet as well served by these developments as the English-speaking world, probably because the skills required are not widely available. Electronic publishing seems not to have appealed to the scholarly community in the Arab and Middle Eastern society, and remains in a dormant state (Nasser and Abouchedid, 2001), and there continues to be a shortage of full-text information resources on CD-ROM or online in Arabic (Al-Qallaf and Al-Azmi, 2002).

Even if the bibliographical sources and services were better known, the problems faced by libraries in acquiring publications because of the weaknesses of the book trade, and particularly the inhibitions on international distribution, have long been known as a problem in the Arab world (Calvin, 1976; Del Castillo, 2001). This, surely, strengthens the case for resource sharing in the region.

¹ MDS [Online]: <http://www.multidataonline.com> [Accessed 3 March 2005]

² AskZad [Online]: <http://www.askzad.com> [Accessed 3 April 2005]

The concept of "resource sharing" between libraries was encompassed in the original aims and constitution of the Gulf States Cooperation Council, which requires the Council to look into means for realising coordination, integration and cooperation in all economic, social and cultural affairs (Ashoor, 1989). However, Sewell, who had had some experience of the Arab world (and elsewhere) as a consultant working for UNESCO, whilst writing persuasively in support of resource sharing between libraries, also cautioned that:

"In developing countries, resource sharing is both easier and more difficult: easier because it is obviously needed to make the best use of scarce library and information resources, yet more difficult because it is often hampered by a formidable range of constraints." (Sewell, 1981)

Resource sharing in the Gulf States

Sewell (1981), formerly the British government's Senior Library Adviser and a collaborator in the development of UNESCO's guidelines for national library planning, wrote that:

"Resource sharing may appear to be nothing more than a new term for the familiar concept of library cooperation. True, many of the same activities are included, but there is a significant difference in the approach... Resource sharing may be seen as a term for working out inter-institutional relationships for the benefit of users in a profession which is frequently described as changing from a materials-orientation to a client orientation."

Resource sharing is not a new concept in the Arab world, as no single library or information centre has ever been able to fulfil the needs of its patrons (AlQudsi-Ghabra, 1999), but it has been stimulated by users' increasing expectations that information will be supplied rapidly, and regardless of their distance from its source. Historically, scholars used to travel to libraries across the Arab countries in their search for information in different areas of knowledge (Aman, 1989). As communications improved, librarians began to develop ways in which the information could instead be sent to the user.

The criteria for successful performance in information provision are constantly being raised not only as a result of continual innovations in communications technology, but also by changes in approaches to teaching and learning and the relentless increase in research and publication. The new Communication and Information Technologies have been an important enabler in the globalisation of our society (Palvia & Palvia, 1996). Their appearance has brought massive changes in every human domain, by providing the opportunity to transmit, access, and share data, information and complex multimedia, whether locally or internationally, with ever increasing speed. Although we sometimes have to remind ourselves that international standards for microcomputers were first set by the production of the IBM Personal Computer only 25 years ago, and that the growth of the Internet was stimulated by the introduction of what we now call Web Technologies only 10 years ago, we must now accept that we live in a digital age and resource sharing making use of data communication networks is a central feature of library activity (Rush, 1992).

In common with most library activities, resource sharing has been influenced by recent technological developments. The International Federation of Library Associations (IFLA) has always encouraged libraries and information centres to

collaborate, and a speaker at a recent IFLA workshop on library cooperation highlighted:

"The enormous potential for international cooperation in the exchange and utilisation of information that today's technology offers, and tomorrow's technology promises, presents a unique opportunity to library and information professionals. The growing demand for bibliographic exchange, multicultural internet resources, research unhampered by geographic or linguistic limitations, and cross-cultural networking, both in the sense of online technology and offline partnerships, is a challenge to libraries which should be welcomed and which must be addressed." (Hiraldo, 2003)

The libraries in the Arabian Gulf region are well placed, geographically and culturally, to develop a variety of approaches to resource sharing. However, changes in collaboration between libraries in the Gulf States appear to have taken place slowly and in very limited ways since one commentator noted some 15 years ago:

"Unfortunately, one important aspect, which can help enhance the accessibility to information for fulfilling information needs of the academic and research community, has been totally neglected. This is the pooling and sharing of resources of various institutions for overall better access." (Ashoor, 1989)

The growth of education, research and publication faced libraries with major challenges, and led to a greater interest in resource sharing, particularly in collection development, the creation of bibliographic networks, and interlending. Maurice Line (1978), then Director General of the British Library's Document Supply Centre (BLDSC), suggested that in many developing countries the combined resources of two or three major collections should be jointly planned to satisfy 70% of national interlending demand, and that this should be regarded as a reasonable proportion, except where a group of countries deliberately organise themselves into a unit for covering relevant literature. Bouazza (1986) examined the obstacles to resource sharing among libraries in the Gulf, and noted barriers caused by political, professional, and cultural factors. Ashoor (1989) noted the difficulty of establishing common bibliographic standards across the region. Sliney (1990) described the problems hindering progress in the region, particularly the lack of library cooperation. Bukhari (1996) reported that the Special Libraries Association Arabian Gulf Chapter Conference held in Al Ain focused on strengthening resource sharing in the region. This included a session by Line on national and regional interlending, and other sessions that highlighted the constraints that the shortage of qualified personnel imposed on the development of improved bibliographic systems and networks. Al-Humood (1998), AlQudsi-Ghabra (1999), and Anwar and Al-Jasem (2001) examined resource sharing in Kuwait, and identified a range of inhibiting factors, but were also able to point to an increase in activities, with interlibrary lending as the most common of them. On a more positive note, Harrison and Scepanski (2005) report the first activity to create an online union catalogue of the holdings of the major libraries in one of the Gulf States.

Inter Library Lending in the Gulf States

Interlibrary lending has long been the most usual way of cooperating and sharing resources, but requires bibliographical tools and services, communication channels, and an organisational framework. The 8th general conference of the

Arab Bureau for Education for the Gulf States held in Qatar in 1985 adopted a policy for inter-library lending between universities in the Gulf States and prescribed much of the procedural detail (Aman, 1989). This should have been assisted by the introduction of machine-readable catalogues, and through the development of GULFNET, the telecommunications network linking academic and research institutions in the Gulf, which was established in 1985 to provide access not only to international database services but also to facilitate document delivery services (Basager, 1995).

There have since been a number of studies of Inter Library Loan services in the Arab countries. Aman (1989) noted the limited progress that had been made in establishing cooperative networks for interlibrary lending. The practice was not widespread in the Arab countries (Fihri, 1994), but was carried out by some university libraries – including some in the Gulf states - on a voluntary basis (Sari, 1994; Zehery, 1997). A decade after the Qatar agreement, despite apparent widespread support in principle, resource sharing and library cooperation in the Gulf were minimal, and in many cases the operation of Inter Library Loan services was far from efficient and speedy (Siddiqui, 1996). Zehery (1997) calculated that the direct costs of Inter Library Loan requests accounted, on average, for about 1% of the budget of six major university libraries in the Gulf region, but that some spent significantly more than others did.

The potential speed of delivery of items requested through the Inter Library Loans service has been transformed by the development of systems for the electronic delivery of documents. The introduction of such systems in the Gulf States could make a significant contribution to the development of academic and research institutions and to the modernisation of society. Bukhari (1996) reported that the participants in the 1995 Conference of the Special Libraries Association Arabian Gulf Chapter were informed that the British Library Document Supply Centre (BLDSC) expected to be able to supply requests through the Ariel system later that year. Vassie (2000) noted that the professional community in the Gulf region had again been reminded, by a presentation at the Special Libraries Association Arabian Gulf Chapter Conference in 1998, that Ariel software was available to facilitate Electronic Document Delivery. In a more recent paper, Siddiqui (2003) examined developments in Electronic Document Delivery and its potential for resource sharing in the Gulf States, concluding that the Ariel software would be the most effective solution, and found widespread support for its introduction. Nonetheless, there was little evidence - in the literature - of any library implementing these systems.

Document delivery technologies

The use of automated systems has become one of the most common features of libraries and information services. The continuous development of computer technology has facilitated the process of transmitting, storing, retrieving, and accessing information, and has raised the expectation that world wide sources of information and documents can be tapped to support teaching, learning, research, and community services. Thus, it has enabled all types of libraries to expand their services and deliver them to users beyond their walls.

Inter Library Lending has been particularly affected by the continuous development and application of Information Technology. The standardisation of bibliographic data, and the development of OPACs, Online Public Access Catalogues, connected over the Internet have rendered searching the catalogues of remote libraries to find information a much simpler task. The digitisation of indexing services and the evolution of full-text searching has made the identification of relevant information easier and faster, whilst the introduction of full-text electronic journals has facilitated immediate access and delivery to identified sources of information. As electronic journals are not yet common in the Arab world, there should remain some interest in other forms of Electronic Document Delivery.

Electronic technology applied to Document Delivery appeared first in the form of the Fax machine. Historically, the idea of the Fax machine was conceived in 1843 in England by Alexander Bain, but it was not until 1966 that Xerox introduced the Magnafax Telecopier, and the first contemporary Fax machine appeared during the late 1970's. The fax machine became a familiar tool in libraries, and was widely used for document delivery. Various experiments took place during the late 1980's, including the Network Fax Project at Ohio State University and the Digitized Document Transmission Project (DDTP) at North Carolina State University (Tedd, 1993), which demonstrated the advantages of transmitting documents electronically.

In 1984, Dean and Moeller developed a technology that allowed IBM and other compatible computers to interface with other devices such as scanners. This made possible the system in use today that was initially developed during 1990 for the Research Libraries Group in the USA³. This group devised a software program, named *Ariel* after the servant of Prospero in William Shakespeare's play *The Tempest*, because "Ariel delivers as fast and faithfully as his master requires" (Jackson, 1993). In 1993, the International Standards Organisation issued the first version of an Interlibrary Loan Protocol to specify rules that permit the exchange of Interlibrary Loan messages between computerized ILL management systems, regardless of the hardware and software packages used by either the requester or the supplier, and there is growing compatibility between the various systems. A variety of software packages are now available to support Inter Library Lending, including Atlas/OCLC's ILLiad⁴, Fretwell Downing's VDX thru JEDDS⁵, Relais International's ILL⁶, and RLG's ILL Manager⁷, all offering a variety of compatibility with versions of Ariel.

Ariel[®]

³ Research Libraries Group [online] : <http://www.rlg.org/index.php> [Accessed 17 May 2004]

⁴ OCLC's ILLiad [online]: <http://www.oclc.org/illiad/> [Accessed 19 June 2005]

⁵ Fretwell Downing [online]: <http://www.fdggroup.co.uk/fdi/products/vdx4.html> [Accessed 19 June 2005]

⁶ Relais International [online]: <http://www.relais-intl.com/relais/home/index.htm> [Accessed 19 June 2005]

⁷ RLG's ILL Manager [online]: http://www.rlg.org/en/page.php?Page_ID=345 [Accessed 19 June 2005]

Ariel, now available in version 4.1, is a stand-alone system that is designed to work on PCs connected by way of a Local Area Network to high-speed internet connections. It is a software package that aggregates all the characteristics from recent technologies, such as communication systems, scanning, file management, and printing, and combines them together for sending and receiving documents through the Internet (Siddiqui, 2003). It is menu-driven and has extensive help screens built into the system. With Ariel, the text image is compressed to less than 8% of its original size, and sent through the File Transfer Protocol (FTP) via the Internet as a secure encrypted package to the receiving PC where it is decompressed. The requested documents are then stored on a website where the user can log in to view the information.⁸

The main advantages that Ariel has over Fax are:

- There is no long distance telephone charge;
- It has a high image resolution, at 300 x 300 dots per inch (dpi) or even higher, whereas the Fax transmission resolution is usually only 100 x 200 dpi;
- The original source can be scanned and transmitted without an intermediate photocopying process.
- The transmission process, both sending and receiving, can be done at the same time;
- Documents can be stored and forwarded at a later time, or used for other electronic applications, such as creating electronic reserves or e-books;
- All the equipment required is commonly available in libraries;
- Ariel can be installed on PCs used for other applications, and runs under Windows, which enables multi-tasking by other programs while Ariel is working in the background (adapted from Jackson, 1993; Landes, 1997).

Recently, the use of Ariel has gradually decreased in the English-speaking countries, because of the increasing online availability of current and back issues of journals (Labriga, 2004). However, the use of Electronic Document Delivery can still offer the libraries in the Arab world an opportunity to improve their Inter Library Loan service, particularly for sharing Arabic-language materials (Aman and Abdel-Motey, 2004).

Research Questions

Few researchers appear to have investigated the use of Electronic Document Delivery services in the developing countries, particularly in the context of academic libraries in the Arab countries. This study, therefore, specifically aimed to understand why there had been no progress towards implementing EDD to enhance the Inter Library Loan services provided by three major library services in Kuwait: Kuwait University, the Public Authority for Applied Education and Training, and the National Scientific and Technical Information Center (NSTIC). Kuwait was selected as a case study for closer investigation because the major academic and research libraries clearly needed to engage in resource sharing to make good deficiencies in the collections to which their communities had been accustomed before being looted during the Iraqi invasion in 1990, and depended on local and international Inter Library Loans to complement the smaller

⁸ Ariel [online]: <http://www.infotrieve.com/ariel/> [Accessed 17 May 2004]

collections that they had since managed to acquire. The research focused on Ariel because there was clear evidence from the literature that its use had been promoted at various professional meetings in the region. The libraries in Kuwait had implemented many other forms of the new Communication and Information Technologies, but apparently had not yet fully implemented EDD technologies to improve the speed of their performance in providing items requested through the Inter Library Loan service.

Yin (1994) argues that qualitative research approaches such as case studies are the preferred strategy for answering the 'how' and 'why' questions. By reviewing the stages through which activities have evolved, it is possible to establish 'how' development took place. Putting those activities in a broader professional context and in their national and international contexts makes it possible to understand more about 'why' developments had or had not taken place.

It is common for researchers to use several research methods to verify the validity of the information being gathered (Blaxter *et al.*, 2001). To achieve its goal of understanding why EDD has not yet been implemented to facilitate local resource sharing between the major libraries in Kuwait, questionnaires and interviews were used to explore the attitudes of staff towards the application of recently developed technology and their perceptions of the advantages likely to be gained by using and implementing new technology for the Inter Library Loan service. 40 questionnaires were distributed in August 2004 to librarians who were working to provide the Inter Library Loan service at these three Kuwaiti establishments, and all were completed and returned. Their responses were supplemented by 8 interviews. The professional experience of these eight interviewees, who were all senior members of the staff of the three libraries or teachers of library and information science at Kuwait University and PAAET, was between 7 and 21 years, and their interests focused in and around the information technology domain. Based on the results of these investigations, the paper discusses the barriers that have held back the adoption of EDD technology in Kuwait. Subsequently, the authors received verbal reports of the use of the Ariel Electronic Document Delivery system in the Gulf States, and these are noted in a concluding section on the implications for the region.

Libraries in Kuwait

Although the history of the educational system in Kuwait goes back more than 100 years, and the first 'public library' (Al-Maktabah Al-Ahlia) was established in 1923, it is only in the last 50 years that the government of Kuwait has been able to develop these social services by investing money from the country's massive oil revenues. The main objectives for the State education system are:

- To aid all learners to achieve comprehensive and integrated spiritual, mental, social, psychological and physical growth to the maximum of their abilities and possibilities.
- To enable the learners to reach self-fulfilment and to participate in realising the programs of Kuwaiti society, in particular, and those at the Arab and Islamic world, as well as to that of humanity in general (Ministry of Education, 1985).

Higher education began to emerge in Kuwait during the 1960's when the government established Kuwait University. Applied education also emerged from the beginning of the 1960s in separate institutions tasked with meeting the requirements of the nation for technical graduates to fill the developing job market. During 1982, most of these institutions were reorganised and combined as Colleges of the Public Authority for Applied Education and Training (PAAET). The main differences between the PAAET Colleges and the University are that, to date, there have been no postgraduate studies and little research activity in PAAET. There have been, however, several attempts to introduce postgraduate courses and to increase scientific research, and these features strongly in the PAAET's future aspirations (Al-Hajri, 2002). The government extended its interests in 1973 to support for one of the most important research institutes in the Middle East, the Kuwait Institute for Scientific Research (KISR). This institute had been established in 1967 by the Arabian Oil Company Limited (Japan), and now carries out research in a wide range of scientific areas relating to industry, energy, and agriculture that contribute to the social and economic development of not only Kuwait, but also the other Gulf countries and the rest of the Arab World (KISR, Online).

With the gradual development of Kuwait University, 10 libraries were established at various campuses. During 2002, the University combined four of these libraries in the Jaber Al-Ahmed Central Library. Presently, the PAAET comprises five colleges and seven training institutes (Abdel-Hameed, 2003). Each college has separate campuses for males and females, (Al-Ansari, 1992), and consequently there are 17 libraries. Within KISR is the National Scientific and Technical Information Center (NSTIC), whose role is to develop, retrieve, and disseminate relevant information resources whether internally generated or from external sources. Thus, today, Kuwait has three substantial academic and research library services, which are used not only by faculty members, researchers, and students, but also by the public. In describing the efforts of the government of Kuwait to improve them, Al-Musalam (1988) noted:

"The Kuwaiti government has focused a great deal of attention on establishing and maintaining information systems and centres to meet the demands of developing nations as well as to support its goal of reaching equality with technologically advanced countries. Although there are many problems and difficulties that slow library development, libraries in Kuwait have been multiplying... All of the libraries are trying to adapt to the needs of modern life by developing plans to overcome problems related to equipment, staff, and functions" (pp.21-22).

Acquisition or access?

Regrettably, the collections of these Kuwaiti libraries were affected by the looting that took place during the Iraqi invasion in 1990. However, the scale and impact of their losses differed. The University Libraries' collection formerly comprised 700,000 volumes, 300,000 items of audio-visual material and microfilm (Kuwait University Libraries Guide, 2001), and approximately 4,850 Arabic and non-Arabic scientific periodical titles (Anon., 1994). Currently, after more than 10 years of rebuilding its collections, the University Library contains about 323,000 volumes of Arabic and non-Arabic monographs, and approximately 20,000 audio-visual items, and subscribes to some 2,900 Arabic and non-Arabic scientific periodicals (Kuwait University Libraries Guide, 2004). The PAAET Libraries' collections emphasise Arabic language materials because all the programs in

PAAET are taught in that language. The collections formerly included 143,000 books, of which 95,000 were in Arabic. However, the PAAET Libraries subscribed to only 185 periodicals, of which only 42 were in the Arabic language (PAAET Library Administration, 1988, pp.1-2). The current collection comprises 95,000 Arabic and non-Arabic books (Al-Ansari and Al-Enezi 2001), and about 170 Arabic and foreign scientific periodicals. NSTIC contained about 40,000 Arabic books, including some 4,000 in the Arabic language, and subscribes to 397 scientific and technological periodicals, 100 of them in the Arabic language (Safar, 2004). Although NSTIC had been completely destroyed (AlQudsi-Ghabra, 1999), the Director claimed, when interviewed, that there were no significant problems in replacing what had been lost during the looting.

It has required major financial provisions in order to restore the facilities, collections, and services of these libraries to something approaching their previous state, as well as coping with the continual pressure for modernisation and updating information. Although Kuwait is one of the world's wealthiest countries, this has been a huge drain on the budgets of these organisations. Budgets have fluctuated according to the state of the national economy and the budget for Kuwait University Libraries in 1998/99 was lower than in any year during the previous decade (AlQudsi-Ghabra, 1999). As Aman (1992) suggested, after the first Gulf War, it may be that:

"Now that the financial resources are strained and a new sense of accountability is being instituted, cooperation among libraries may gain support..."

The looting of the libraries' collections and the budget fluctuations have indeed forced Kuwaiti librarians to implement various methods to make up for the shortages in their collections, with an increasing dependence on the Inter Library Loan service (Al-Motari, 1996; Vassie, 2000) to obtain material locally as well as from other Gulf countries and the BLDSC.

The annual statistics for Kuwait University Libraries and NSTIC for the year 2003 show that there were 316 requests from NSTIC to Kuwait University Libraries, and 236 requests from Kuwait University Libraries to NSTIC. A local request normally takes between 2 to 3 working days to be supplied. There are two ways in which Kuwait University Libraries and NSTIC draw on international assistance to provide the requested materials for their users. First, 622 requests by Kuwait University Libraries and 36 requests by NSTIC were made to some of the academic libraries in the Gulf countries. The requested journal articles were supplied in a collegial spirit and free of charge, i.e. as a favour, or as a gesture of Pan-Arab support. The BLDSC is usually the 'library of last resort' for Kuwait University Libraries and NSTIC to obtain requested publications, books as well as journal articles. In 2003, Kuwait University Libraries made about 1700 requests to BLDSC, while NSTIC made more than 900. Kuwait University Libraries offer this service only for faculty members, research groups, and postgraduate students. It limits faculty to only 100 pages per semester free of charge, but charges for any use by research groups and postgraduate students. NSTIC meets unlimited requests from KISR researchers without charge, but charges any other users.

PAAET provided the Inter Library Loan service only for faculty and with a limit of three articles per year. The PAAET libraries used to make most requests to Kuwait University Libraries, which were provided free of charge, and had made

only 20 requests to BLDSC in 2003. However, even these limited local and international services were suspended in 2004, according to an interview with one of PAAET librarians, because of staff shortages and the preference of PAAET researchers to use the services of Kuwait University Libraries and NSTIC directly. Although Kuwait University Libraries and NSTIC are using electronic mail to make Inter Library Loan requests from the Gulf Cooperation Council countries, and Automated Request Transmission system (ARTTel) for the electronic transmission of interlibrary loan requests to BLDSC, the requested items can take 4 to 6 weeks to arrive from the Gulf countries, or 2 to 3 weeks to arrive from BLDSC (Pilling, 1987; Siddiqui, 2003), because delivery services use commercial mail services or the DHL courier service. The cost of using these services is also high.

IT in Kuwait

The government of Kuwait understands the significance of Information Technology, and thus has embraced the idea of establishing an infrastructure for the information sector, as part of a strategic aim for the state to provide quality services for both the governmental and business sectors (Othman, 2003). The IT revolution gained pace after Kuwait was connected to the Internet during 1994 (Wheeler, 2003), the first country in the Arab world to do so, and since then telecommunications in the Gulf region generally have improved significantly, facilitating the introduction of links between academic and research institutions through GULFNET.

Kuwaiti libraries are not unfamiliar with recent technologies, and there are clear indications that the library services are adopting them. The previous Dean of Kuwait University libraries, Dr. Al-Ansari who is now an Assistant Professor of Librarianship and Information Science in the College of Graduate Studies at Kuwait University, commented to a reporter for *Al-Watan*, one of the Kuwaiti newspapers, that:

“Recently the modern concept of the libraries’ role, based on collecting the essential information resources, and focusing on utilizing and implementing recent information technology and communication, is to gain the benefits of the Internet as an information resource via on-line searching of databases in different areas of knowledge to retrieve bibliographic information or full-texts, whether online or CD-ROM, and also to support the Inter Library Loan service by electronically requesting the documents and other items needed from the BLDSC.” (Al-Motari, 1996)

Nonetheless, Kuwait’s academic and research libraries still employ manual processes in some services that could be automated. One of the most significant processes in these libraries that has yet to fully embrace the use of new technologies is the Inter Library Loan service. Although Ariel had been available since 1991, the benefits of Electronic Document Delivery were not actively promoted in the Gulf region until 1998 (Vassie, 2000). It is therefore, perhaps, not surprising that Dr. Al-Ansari was unaware of the potential of EDD systems at the time of the interview quoted above. Despite several subsequent meetings between the heads of library services to consider different approaches to resource sharing (Anwar and Al-Jasem, 2001), there seems to have been no particular focus on the potential for implementing new technologies to achieve their aims.

Human resources in Kuwaiti libraries

The first library education program was introduced in Kuwait in 1977, as a two year programme in one of the departments of the then Kuwait Teachers' Institute (now the College of Basic Education at PAAET) to train high school graduates to be assistant librarians to fill the needs of the public and school libraries (Abdel-Motey and Al-Hmood, 1992). In 1986, the programme was developed into a four-year Bachelors degree program to meet the needs of a wider range of libraries and information centres. Despite these developments, the shortage of professional library staff continued for many years (Abdel-Motey and Al-Hmood, 1992). Al-Ansari found that the number of professional graduates in the field of library and information science fell far short of meeting the country's manpower requirements (Al-Ansari, 1992).

As a contribution to solving this problem, a plan to create a postgraduate programme for Libraries and Information Studies had first been put forward at Kuwait University in 1988, but its implementation was delayed by the Iraqi invasion of Kuwait. Finally, during 1995, the College of Graduate Studies at Kuwait University established a Masters Degree programme in Librarianship and Information Studies for students who already had a Bachelors Degree in other disciplines (Al-Qudsi-Ghabra, 1999).

During this period, several studies continued to criticise the PAAET curriculum or the quality of the students enrolled (e.g. Aman, *et al.*, 1992). Even in the mid-1990s, the PAAET curriculum appeared to offer only basic instruction in the use of Information Technologies (Al-Khabbaz, 1996). However, during 2001-2002 a separate Department of Libraries and Information Science was established to raise the quality of the undergraduate programme and increase the range of modules, and also to plan a postgraduate programme in the field of Information Science (Al-Hajri, 2002).

Beyond these references to the shortage of manpower and skills gaps in the workforce, the literature of library and information science remains silent on the particular arrangements for employment in Kuwait that may further complicate the situation.

There are two ways to apply for government jobs in the State of Kuwait. The first is via the employment foundation known previously as the "Dewan Al-mowadafeen" and more recently as "The Council of Civil Service". This is responsible for organising the employment system in the State, and it controls most of employment opportunities in the ministries and other governmental organisations. Although the Dewan is trying to offer the best service for its applicants, it has faced a number of dilemmas because of the size of its annual budget and the continually changing decisions about the Kuwaiti job market's requirements. Most of the graduates in Kuwait proceed to it to apply for governmental employment. Because of the complicated procedures that this organisation has to follow, an applicant may wait for months, and even sometimes over a year, to be directed to a job vacancy, and may then not be placed in employment relevant to his or her qualifications. Mostly, jobs are assigned randomly. Recently, however, Dr. Rashed Al-Hamad, the Minister of Education, has made a statement that the "Dewan Al-mowadafeen" should

refrain from appointing PAAET graduates to purely administrative posts (Bandak, 2004).

An alternative employment system offers more certainty in matching skills to vacancies. There are some ministries and governmental establishments that are decentralised, meaning that the employment process does not require individuals to go through "Al-Dewan". This gives candidates an opportunity for rapid employment, and also gives employers an opportunity to fill vacancies with appropriately qualified staff. KISR and Kuwait University are considered two of these decentralised organisations, but PAAET must still recruit through "Al-Dewan" for non-teaching posts, including librarians.

Once employed, library staff in Kuwait (except in the special libraries) appear to be poorly managed and motivated (Al-Hassan and Meadows, 1994).

Barriers to adoption of EDD

Bo-Shehri, an Assistant Professor in the College of Business Studies at PAAET, recently conducted a study of technology transmission to Kuwait, and summarised the main obstacles to taking advantage of recent IT developments as follows:

- Weaknesses in coordination or complete non-cooperation between governmental authorities and establishments.
- The absence of technological strategies as guidelines for legislation.
- A clear decline in Kuwaiti employees in the essential economic sectors.
- Non-availability of databases that contain information about the latest developments in the world.
- The shortage of research centres and lack of research studies in IT-related areas (Anon, 2004).

The surveys undertaken as part of the present project provided valuable information to complement that derived from the literature, and produced results that were in some respects comparable with those of Bo-Shehri.

Attitudes towards resource sharing

All of the interviewees agreed that there are potentially great benefits from resource sharing activities, especially with the recent technological advances that offered possibilities for facilitating information exchange between different libraries. However, there was some concern that these benefits had yet to be felt in the Gulf region:

"Recent automation systems have common languages, and... These languages aided the process of bibliographic information exchange between libraries and information centres world wide... Although, in Kuwait, as well as in the Gulf countries', academic libraries have implemented different types of automation systems such as VTLS, Horizon, and others, they have not taken any further steps to exploit the main benefit of these systems, which is resource sharing of their items between the Gulf libraries." (Interviewee B)

A possible explanation was provided by 26 of the 40 librarians who completed the questionnaire, who thought there would be problems with the process of implementing new technology and with the cost of it. Most of the interviewees

were familiar with the libraries' budgets, and also believed that they were barely sufficient to cover the libraries' current expenditure. One interviewee commented that:

"The libraries of Kuwait University as well as others had to start from the scratch in order to rebuild the collections of the libraries. And, there is huge drain in the libraries administration budget, especially with the scientific journals... The huge amount that is spent from the libraries administration budget for the rebuilding process after the liberation and up until today has negatively affected the developmental process in these libraries, which as a result has limited these libraries' ability to satisfy their patrons' information needs." (Interviewee C)

There was, nonetheless, some evidence that progress in developing approaches to resource sharing was being made:

Until now there is no protocol or agreement in Kuwait for any resource sharing or document information exchange between libraries and other governmental establishments such as the Ministry of Education (public libraries), or even internationally with the Gulf libraries, except with the Sultan Qaboos University in Oman, because Oman is considered to be one of the most active countries in the Gulf area in providing this rapid service... However, during Session 2001/2002, there emerged a type of resource sharing between Kuwait University and NSTIC in the form of a union list of all the scientific periodicals in both establishments, in order to avoid duplication and to facilitate the Interlibrary Loan service between both establishments' libraries." (Interviewee C)

Awareness of Electronic Document Delivery systems

Most of the interviewees had no clear understanding of Electronic Document Delivery or the benefits to the Inter Library Loan service through introducing this technology. None were aware of the Ariel software, even most senior staff of Kuwait University, from whose libraries Siddiqui had received an encouraging response to his enquiries little more than a year earlier (Siddiqui, 2003), and where unsuccessful efforts to implement the software had already been made. One interviewee frankly explained that:

"There is not enough motivation for improving library services, whether from librarians or heads of librarians. Moreover, in Kuwait as well as in the countries around it, until now there have been no agreements between libraries and information centres to facilitate resource sharing and to confirm cooperation, and if there are, it is in an amicable and friendly form and it is not codified by a clear strategy or policy. Thus, as a result most librarians do not know enough about Electronic Document Delivery as well as other resource sharing activities." (Interviewee B)

The same interviewee, however, asked about the benefits of Inter Library Loan, was convinced that:

"This service is a great method of saving the library budget, especially from buying unimportant items that they do not use. As mentioned previously, it helps the library to gain its patrons satisfaction. Also, it gives the library a great opportunity to gain a resource sharing activity, which as a result will support the library with wider collections in developing the library services." (Interviewee B)

Given this kind of support, the response to the questionnaire was somewhat unexpected. 22 of the 40 respondents believed that developing the Inter Library Loan service to provide more rapid delivery of requested items would not benefit the standing of the library or information centre. This suggests that concerns

about Arab librarians' apathy towards the users' demands for document delivery may still have a basis in fact, and that:

"This is an area that requires constant emphasis, education, legislation and whatever else is needed to instil the concept of service to users and to emphasize that the purpose of libraries is to make material conveniently accessible." (Aman, 1989)

Attitudes toward the applications of Information Technology

Among the respondents to the questionnaire survey, there was a degree of confidence in the introduction of electronic systems. Only three believed that practical problems would emerge after the Inter Library Loan service became more dependent on Information Technology.

When asked about the current state of the IT infrastructure in Kuwait, all of the interviewees emphasised that there are clear indications of progress. Nonetheless, while acknowledging that the Kuwaiti government is expending great efforts on building an IT infrastructure, the interviewees exposed several significant concerns related to the development of library services.

One interviewee pointed out that:

"Hitherto, there was little progress in the state of IT in Kuwait, because all the executives up to the Ministers, whether for education, planning or any other Minister that represents high authority in Kuwait were not convinced of the importance of Information Technology and the communications revolution..." (Interviewee A)

Confirming the opinion expressed by Rehman (2000) that there is little activity towards the formulation of an information policy in Kuwait, another interviewee emphasised that:

"Despite the government, as well as Kuwait University, or any other organisation in the State of Kuwait, spending huge budgets on IT developments, there was a limited vision from the beginning in creating a clear work plan and strategy for the IT infrastructure, which as result blinded the whole university to aspects of gaining the benefits out of this revolution." (Interviewee C)

36 of the 40 librarians believed that recent IT developments offered several tools that could improve the services of the libraries and information centres, and a similar number believed that they understood the main benefits to be gained from using new technology, in terms of saving time, effort and cost. Thirty-one respondents believed that the electronic processes and services would produce better outcomes than manual procedures. 28 considered that using the latest advancements in IT was essential to the libraries.

Despite the ready acceptance of the fax machine, there was a significant degree of potential resistance to the introduction of more complex electronic methods. Fourteen of the 40 librarians who responded to the questionnaire survey still recommended providing the inter library loan service without computer assistance. There is still, clearly, a body of resistance to change that had been noted in an earlier study (Al-Hassan and Meadows, 1994).

Human resources

Abdul-Hadi (1999, quoted by Kandeel, 2001) observed that the main barrier to the efficient operation of any type of library or information centre, and realising all the potential benefits from the new technologies, is the lack of understanding of the importance of using IT and a lack of familiarity with and skills in the use of IT applications.

Most of the respondents to the questionnaire survey felt, however, that there was no need for librarians to be experts in computer applications. However, 9 of the 40 believed that a librarian should have a high level of computer skills in order to use automated library systems. One of the major libraries had adopted its own strategy to circumvent these limitations:

"The NSTIC is trying to avoid all the IT difficulties in the State of Kuwait by employing professionals in this area as well as expending a great effort to keep up to date in order to follow developed countries' libraries and information centres and to gain, as a result, the best services for KISR researchers." (Interviewee H)

There was more agreement about the impact of staff shortages. All the interviewees agreed that there is a great shortage of staff who had studied librarianship and information science, and that this was inhibiting the development in their libraries. One stated that:

"There are several services that PAAET libraries have stopped providing to its patrons, as well as some libraries being closed because of the extreme shortage of librarians at these academic libraries. Although ... I have requested 20 librarians in order to overcome this dilemma ..., all that I have received are 2 librarians out of the 20." (Interviewee D)

This situation is exacerbated by the fact that:

"There is a clear indication that the absence and dissatisfaction of librarians in Kuwait University libraries, as well as in other academic libraries in the nation, is caused by the absence of financial inducements to encourage people to take up the profession, and is due to the fact that librarians in Kuwait receive the minimum income, without any financial compensation compared with other jobs in the state." (Interviewee C)

The questionnaire respondents generally felt that the introduction of IT based methods would be beneficial in terms of their status. There were, however, some concerns about the impact on their workload. Whilst almost half (19) of the librarians believed that their workload would decrease after developing library services, 14 of the respondents believed it would increase their workload. This perhaps reflects a concern that has been felt in Kuwait since the end of the first Gulf War, when political restrictions on the employment of expatriates from countries judged to have been unsupportive of Kuwait severely reduced the workforce and placed greater pressure on those who remained (Aman, 1992; Al-Hassan and Meadows, 1994).

Thus, we may conclude that the concept of resource sharing enjoys general support in Kuwait, but practical steps are inhibited by a limited awareness of the availability of EDD systems. Similarly, the application of new Information Technologies to library services is seen as beneficial, but high level support has not been transformed into effective implementation strategies, not least to overcome an inherent resistance to change. Motivational problems are compounded by staff shortages and skills gaps in the major academic and research libraries.

EDD in the Gulf States

This study recognises that the data provided by such a small sample of respondents to the questionnaire and interviews in Kuwait would have limited applicability to other libraries in the region. The states in the Arab Gulf region do appear to be some of the most fraternal countries in the world in the similarity of their heritage, culture, and religion. Although some of the themes and issues emerging from this study may be mirrored in those countries, it is recognised that each will have its own unique history and circumstances. The strength of this study is in its depiction of three institutions' responses to a situation they face. It is possible only to speculate about the implications for institutions in the other Gulf States of the results of this small investigation in Kuwait.

It is clear that the basis for regional resource sharing in the Gulf States exists in international policy agreements, and Al-Ibrahim (1993) has also concluded that there would be no problems in finding the finances or electronic equipment required to improve Inter Library Loan services in the libraries in the Gulf region. Introducing Ariel software for interlibrary lending would not itself represent a major cost as it is a stand-alone system. The equipment required is generally available in most libraries, or can be purchased without difficulty or great expense, and the Ariel software itself is not particularly expensive.

Offsetting these positive factors is the fact that Ariel was little known in the Gulf States five years after it was introduced (Siddiqui, 1996), and appears to have not been widely adopted by the academic and research libraries since it was promoted at the region's major professional conference seven years ago (Vassie, 2000). This may, in part, be explained by the absence of a sales agent for Ariel in any of the Arab states. Nonetheless, senior staff in some of the region's major academic libraries have recently stated their support for it (Siddiqui, 2003). It has been introduced in the American University in Sharjah, Kuwait University and the United Arab Emirates University (UAEU) at Al Ain but, in conversation with the authors, staff of these libraries all reported that they encountered technical difficulties because of the limited local availability of expertise in implementing IT applications. Kuwait University Libraries suspended its efforts without success. The UAEU successfully implemented it but later suspended its use, reportedly influenced not only by the technical problems but also by the extra charges levied by the BLDSC to cover its copyright licence agreements. However, it is now known that it has been adopted and is regularly used by a significant number of the medical libraries in the region.

It is difficult to understand why there have not been greater collective efforts towards more widespread adoption by the academic and research libraries of a system such as Ariel that appears to offer a faster and less costly method of document delivery than using mail or fax to send photocopies of documents within the region, particularly Arabic language material that is not readily available elsewhere; even unsophisticated use of a scanner and email would seem better than the academic libraries' present arrangements. Perhaps the answer lies in Al-Ibrahim's observation that future developments in resource sharing would depend on the will and ability of the libraries, echoing Ashoor's earlier (1989) call for the

"Identification of an institution in the Gulf willing and capable of taking the responsibility for coordination of network activities... [and the] motivation and guiding of professional circles and library administrators to reach an agreement..."

Clearly someone in the medical field had championed the adoption of Ariel. It seems that the World Health Organisation's Regional Officer for Health Information has been encouraging the region's medical libraries to participate in developing a union catalogue of their holdings to facilitate resource sharing and, to enable them to realise the value of this development, has been providing the Ariel software and arranged the training and technical assistance necessary to implement it successfully. It is not clear which institution would be acceptable as a champion for resource sharing by the region's academic and research libraries, but there appear to be initiatives at a local level, such as an agreement on Inter Library Lending between the two university libraries in Sharjah that has won the support of the universities' managements, which may eventually provide a basis for wider cooperation.

Whether the academic libraries' professional labour force has not only the will but also the ability to implement the necessary changes also appears to need further examination, not least because the manpower requirements to support resource sharing in general and Electronic Document Delivery in particular still need some definition. The libraries in the Gulf States have a historic shortage of locally trained librarians. This has been offset to some extent by employing librarians from other countries, but some have come from countries where the application of Information Technologies in libraries is no more advanced than in the Gulf, and this may prove a restraining factor. To offset the skills shortage, some libraries in the Arab countries have also implemented in-house continuing education programmes to upgrade the competencies of their staff (Chaudry *et al.*, 1993), but the library science educators in the region must also consider what they can do to prepare a new generation of professionals not only in sufficient quantity to meet employers' needs and with a greater technological orientation, but also with a greater awareness of the potential benefits of resource sharing for their libraries' users, and a greater willingness to take initiatives to that end.

The world is changing, and governments of the countries in the Gulf region know that they need to change with it. The emerging "knowledge society" depends on the efficient and rapid transmission of information, and the academic and research institutions in the Gulf must respond to those expectations. In terms of the issues discussed in this paper, the libraries in those institutions face a stark choice, between implementing Siddiqui's recommendations (1996; 2003) for the establishment of an Inter Library Loan Network, based on Electronic Document Delivery, or being marginalised in society by the transformation into reality of Aman's (1989) fears about private sector companies taking their place as the principal agents of document supply.

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